



THIN PLATE SUPPORTING CONTAINER

CROSS-REFERENCE TO RELATED APPLICATION

This application claims, under 35 USC 119, priority
5 of Japanese Application No.2002-379340 filed on December 27,
2002.

BACKGROUND OF THE INVENTION

Field of the Invention

10 The present invention relates to a thin plate supporting
container for housing, storing, and transporting thin plates
such as semiconductor wafers, storage disks, or liquid crystal
glass substrates.

15 Related Background Art

A thin plate supporting container is generally
constructed by a container body and a lid unit for closing
the upper opening of the container body. In the container
body, slotted plates are provided on opposite side walls,
20 and a plurality of thin plates such as semiconductor wafers
are supported between the slotted plates.

The slotted plates are detachably supported in the
container body. Specifically, a supporting hole is provided
in~~opened on~~ the slotted plate side and a supporting projection
25 is provided on the container body ~~side~~. By the mating of the
supporting hole and the supporting projection, the slotted
plates are detachably supported in the container body. As
disclosed, for

— ~~For example, in International Publication WO99/39994 wherein discloses the technique. A supporting hole is opened on a slotted plate (thin plate supporting member) side and a supporting projection to be fit in the supporting hole is provided on the container body side. The sets, each consisting~~
5 of the supporting hole and the supporting projection, are provided in three positions. —

— Since ~~the~~ sets of the supporting hole and the supporting projection are provided in three positions, the slotted plate
10 is not deflected. Provision of ~~A mode of providing the sets in only in two positions, i.e. at opposing both~~ ends of the slotted plate is also possible. In this latter case, however, since the supporting hole and the supporting projection have a circular shape and can rotate in a state where they are
15 fitted ~~fit~~ with each other, the slotted plates may be deflected.

Further, since the slotted plate is positioned by the supporting hole and the supporting projection, ~~the position in the deepest~~ portion of the slotted plate may be slightly deviate ~~ion~~. ~~In this case, in a state where~~ When the thin plate supporting container is disposed longitudinally,
20 semiconductor wafers are supported in the deep portions of the slotted plates and, if. ~~If there is a positional deviation in the deep portions of the slotted plates, the positions of supporting a semiconductor wafers will deviate is deviated~~
25 in the thin plate supporting container.

A plurality of plate segments forming pieces ~~constructing~~ the slotted plate ~~are formed so as to curve along~~ the periphery of a semiconductor wafer close to an inlet/outlet

port. ~~of semiconductor wafers. In this case, an~~ Because the
inlet/outlet port side of a plate piece largely extends toward
the semiconductor wafer, ~~there is a high side, so that the~~
possibility that a semiconductor wafer ~~to be supplied/taken~~
5 out ~~will come~~ ~~comes~~ into contact with the plate ~~segment~~ ~~piece~~
~~is high~~. To solve the problem, the inlet/outlet port side
of the plate piece ~~must has to be~~ widened ~~toward~~ the container
body ~~side~~. In this case, however, the semiconductor wafer
supporting positions are ~~at~~ the innermost end ~~deep side~~ and
10 at an intermediate position. There is no support near the
inlet/outlet port, so that the supporting is unstable.

Between ~~the~~ semiconductor wafers ~~housed in the thin~~
~~plate supporting container~~ and the bottom plate of the thin
plate supporting container, a sufficient gap is provided to
15 prevent the semiconductor wafers from coming into contact
with the bottom ~~plate~~ in case of an abnormal shock, in the
case of a fall ~~of the thin plate supporting container~~ or the
like. To provide such a gap ~~In this case~~, however, the thin
plate supporting container must be taller ~~is tall~~. When the
20 thin plate supporting container is packed in a box, the gap
between the bottom of the box and the bottom of the thin plate
supporting container is small. Accordingly, ~~the~~ an amount of
cushioning which can be ~~is~~ put between the bottom of the box
and the bottom of the thin plate container ~~is~~ becomes small.
25 Although there is no problem in ~~a normal transportation state~~,
in case ~~of occurrence~~ of an abnormal shock due to a fall ~~from~~
~~a high place~~ or the like, the small amount of the cushioning
poses a problem ~~becomes some trouble~~. It is preferable that

the amount of cushioning ~~beis~~ larger.

A top flange and a handle are detachably attached to the thin plate supporting container. When ~~a strong an~~ external force tending to pull off ~~which is strong in the direction~~
5 ~~of pulling out~~ the top flange or handle is created ~~applied~~ by an abnormal shock due to ~~of a~~ fall of the thin plate supporting container or the like, there is the possibility that a locking pawl or the like will ~~comes~~ off and the top flange will detach ~~er the like drops~~.

10 There is also the possibility ~~a case such~~ that a known latch mechanism for fixing a lid unit to the container body will be ~~is~~ caught by the container body when the latch mechanism is unlatched to detach the lid unit.

On the interior ~~back~~ side of the lid unit, a thin plate
15 pressing member is provided. Fitting grooves are formed in the thin plate pressing member. Semiconductor wafers are fitted into ~~supported by being fit in~~ the fitting grooves and thereby individually supported ~~one by one~~. The fitting groove is formed in a V shape, the angle of the V-shaped fitting
20 groove is usually an obtuse angle, and the periphery of a semiconductor wafer is lightly caught in the fitting groove. Although there is no problem in a normal use mode, by an abnormal shock may cause the ~~of a fall of the thin plate supporting container or the like~~, semiconductor wafers to ~~may~~ turn or
25 be displaced. ~~It cannot be said that the supporting force is sufficient.~~

The thin plate pressing member is formed of ~~constructed~~ by a number of pressing bands disposed in parallel for

supporting the semiconductor wafers separately~~one by one~~ at predetermined intervals, with~~and~~ the periphery of a semiconductor wafer ~~is~~ supported by being fit in a fitting groove formed in the pressing band. In this case, if a
5 semiconductor wafer comes out of~~off from~~ the fitting groove in the pressing band, the semiconductor wafer may enter ~~abe~~ ~~fit in the~~ gap between the pressing bands.

On the bottom of the container body are~~placed~~ transversely, oriented positioning means for positioning the
10 thin plate supporting container ~~is provided~~. The positioning means is constructed by three fitting grooves provided at almost equal intervals. When positioning projections on a base stand side lodge~~fit~~ in the fitting grooves, the container body is accurately positioned. Since the fitting grooves are
15 made of the same material as that of the thin plate supporting container, in entering~~a state where the positioning~~ ~~projections are fit in~~ the fitting grooves, the positioning projections do not slide smoothly. There is the possibility~~a~~ ease that the positioning projection will stop midway in
20 the fitting groove and accurate positioning will not~~cannot~~ be achieved~~performed~~.

SUMMARY OF THE INVENTION

Accordingly, the~~The~~ present invention has ~~been achieved~~
25 ~~in consideration of the above problems and,~~ as its object, provision of ~~is to provide~~ a thin plate supporting container capable of accurately, reliably, and stably supporting a thin plate, to/from which a lid unit, ~~a top end,~~ and the like can

be attached/detached reliably and easily, and which can be accurately positioned.

According to a first aspect of the invention, there is provided a thin plate supporting container comprising by
5 a container body for housing therein a plurality of thin plates, a lid unit for closing the container body, and slotted plates provided on side walls facing each other in the container body for supporting the thin plates housed on the inside from both sides, ~~including an upper fitting means~~ portion for
10 ~~attaching~~ supporting an upper portion of the slotted plate to the container body ~~side~~, and a lower fitting ~~means~~ portion for ~~attaching~~ supporting a lower portion of the slotted plate to the container body. ~~side, the~~ The upper fitting ~~means~~ includes ~~portion including an upper fitting lug~~ piece provided
15 ~~at each of at least at both sides~~ ends of each of the side walls facing each other in the container body, and an upper receiving ~~element, i.e. an elongated bracket~~ piece provided, in a position facing the upper fitting ~~lug~~ piece, ~~one of the~~ one of the slotted plate. ~~The, the~~ the upper fitting ~~lugs~~ each have ~~piece~~ pieces
20 ~~having~~ having a contact face having a flat ~~planar~~ plane shape and which engage the elongated bracket ~~one comes into contact with~~ the slotted plate ~~side to thereby position the slotted plate in the front/rear direction and prevent swinging while~~ suppressing swing of the slotted plate, ~~and a supporting~~ face for supporting the contact face in a state where the
25 ~~contact face is in contact with the slotted plate side, and the upper receiving piece having a face to be contacted having a flat plane shape which comes into contact with the contact~~

~~face of the upper fitting piece to thereby position the slotted plate in the front/rear direction while suppressing swing of the slotted plate, and a face to be supported which comes into contact with the supporting face of the upper fitting piece to thereby support the face to be contacted in a state where the face to be contacted is in contact with the contact face of the opposite side.~~

~~With the structure, when the contact face having the flat plane shape of the upper fitting piece comes into contact with the face to be contacted having a flat plane shape of the upper receiving piece in a state where the supporting face of the upper fitting piece is in contact with the face to be contacted of the upper receiving piece, the slotted plate is positioned in the front/rear direction while suppressing swing of the slotted plate. Thus, deformation such as a deflection of the slotted plate is prevented and the slotted plate can be supported in an accurate position.~~

According to a second aspect of the invention, there is provided a thin plate supporting container comprising a container body for housing therein a plurality of thin plates, a lid unit for closing the container body, ~~and~~ slotted plates provided on side walls facing each other in the container body for supporting the housed thin plates housed on the inside from both sides, ~~including an upper fitting means~~ portion for supporting an upper portion of the slotted plate ~~on~~ to the container body side, and a lower fitting ~~means~~ portion for supporting a lower portion of the slotted plate ~~on~~ to the container body, wherein side, ~~and~~ the lower fitting means

~~includes~~~~portion having a~~ vertical-direction positioning means for positioning the slotted plate in the vertical direction, horizontal-direction positioning means for performing positioning the slotted plate in the horizontal direction, and a front/rear-direction positioning means for performing positioning the slotted plate in the front/rear direction.

~~With the structure, the slotted plate is positioned in the vertical direction by the vertical-direction positioning means. The slotted plate is positioned in the horizontal direction by the horizontal-direction positioning means. The slotted plate is positioned in the front/rear direction by the front/rear-direction positioning means. In cooperation with the upper fitting means~~~~portion~~, the slotted plate can be accurately positioned and fixed.

~~According to a third aspect of the invention, in the thin plate supporting container according to the second aspect, the~~~~The~~ vertical-direction positioning means ~~includes~~~~has a~~ vertical-direction supporting elements (brackets)~~piece~~ which is provided in a lower portion of each of side walls facing each other in the container body which mate~~and is fit in a lower portion of the slotted plate, and comes into contact with a lower end of the slotted plate, thereby accurately performing positioning~~ the slotted plate in the vertical direction ~~of the slotted plate~~.

~~With the structure, the vertical-direction supporting piece fits with the lower portion of the slotted plate and comes into contact with the lower end of the slotted plate,~~

~~thereby accurately positioning the slotted plate in the vertical direction.~~

~~According to a fourth aspect of the invention, in the thin plate supporting container according to the second or third aspect, the~~ The horizontal-direction positioning means includes ~~has~~ a notch formed in a lower edge ~~portion~~ of the slotted plate, and a horizontal positioning projection ~~direction~~ supporting piece which is provided in a lower portion of each of side walls facing each other in the container body, which projection fits within the notch in the lower edge ~~portion~~ of the slotted plate, and performs for horizontal positioning in the horizontal direction of the slotted plate.

~~With the structure, the horizontal-direction supporting piece fits with the notch, thereby accurately positioning the slotted plate in the horizontal direction.~~

~~According to a fifth aspect of the invention, in the thin plate supporting container according to any of the second to fourth aspects, the~~ The front/rear direction positioning means has a front/rear direction supporting element ~~piece~~ which extends ~~is provided so as to extend~~ from the lower portion of the front of the slotted plate to the ~~a~~ back side of the slotted plate where it, ~~and contacts with the lower portion of a side wall face of the container body, thereby positioning the slotted plate in the front/rear direction.~~

~~With the structure, the front/rear direction supporting piece comes into contact with the lower portion of the side wall face of the container body, thereby accurately positioning the slotted plate in the front/rear direction.~~

~~According to a sixth aspect of the invention, in the thin plate supporting container according to any of the second to fifth aspects, a stopper for lockingstopping-~~
5 ~~disengagement from the above of the slotted plate by being~~
~~locked to the container body side is provided at thein a lower~~
portion of the slotted plate.

~~With the structure, in a state where the slotted plate is positioned and attached to the container body, the slotted plate is supported so as not to be disengaged from the above.~~

10 According to ~~another~~a seventh aspect of the invention, there is provided a thin plate supporting container comprising a container body for housing therein a plurality of thin plates, a lid unit for closing the container body, and slotted plates provided on side walls facing each other in the container
15 body and supporting the housed thin plates ~~housed on the inside~~ from ~~opposing both~~ sides, wherein the slotted plate is formed of~~constructed by~~ arranging a plurality of plate ~~elements~~pieces for individually supporting the plurality of thin plates. The one by one, the plate elements extend~~piece~~
20 ~~is extended~~ from an inner side of the container body to an outlet/inlet port ~~of the thin plate and each, from its innermost end~~is formed so that a portion from the inner side to an intermediate position, is curved along the periphery of the thin plate and a portion, from the intermediate position to
25 the outlet/inlet port extends~~is~~ along the container body. On side, on the innermost end~~inner side~~ and the outlet/inlet end of each ~~port side in the plate element~~piece, is a thin plate supporting projections for supporting the thin plates.

~~The are provided, and the~~ thin plate supporting projection
on the outlet/inlet port side is provided at the~~around an~~
~~intersecting point of intersection of the~~ inner
~~edgeperiphery~~ of the plate ~~elementpiece~~ and the periphery
5 of the thin plate.

~~With the structure, a thin plate is supported by the~~
~~thin plate supporting projections provided on the inner side~~
~~of the plate piece and around he intersection point of the~~
10 ~~inner periphery of the plate piece and the periphery of the~~
~~thin plate, so that the thin plate can be stably supported.~~

According to yet another~~an eighth~~ aspect of the
invention, there is provided a thin plate supporting container
comprising a container body for housing therein a plurality
15 of thin plates, a lid unit for closing the container body,
and slotted plates provided on side walls facing each other
in the container body and supporting the housed thin plates
~~housed on the inside from opposing both~~ sides, wherein a gasket
is provided between the lid unit and the container body, the
20 gasket having~~has~~ a base end supporting portion ~~for supporting~~
~~the whole by being fit into~~ the lid unit side or container
bodyside, and a contact portion ~~formed so as to extend~~ extending
from the base end supporting portion, ~~the contact portion~~
~~is formed by being expanded from the base end supporting portion~~
25 and formed into a flange shape, with an~~making its~~ intermediate
portion extending~~swollen~~ upward, and ~~making an~~ outer
periphery folded downward. The,~~and the~~ intermediate portion
is pressed against the lid unit ~~side or the body~~ when~~side~~

~~in a state where the periphery is in contact with the container~~
~~body is closed by side or the lid unit side, thereby making~~
~~the periphery closely sealed attached to the container body~~
~~side or the lid unit side by elastic force of the contact~~
5 ~~portion.~~

~~With the structure, the intermediate portion of the~~
~~contact portion is formed by making its intermediate portion~~
~~swollen upward and folding an outer periphery downward. When~~
~~the intermediate portion is pressed against the lid unit side~~
10 ~~or the body side, the periphery is closely attached to the~~
~~container body side or the lid unit side by elastic force~~
~~of the contact portion. Consequently, even when the gasket~~
~~is deflected, the seal of periphery of can be closely attached~~
~~to the container body to side or the lid unit side can be~~
15 ~~maintained~~ with reliability.

~~According to a ninth aspect of the invention, the thin~~
~~plate supporting container according to the eighth invention~~
~~further includes: a seal piece which is provided on the inner~~
~~side of an upper surface of a The base end supporting portion~~
20 ~~of the gasket serves as a seal piece in, is extended upward,~~
~~and comes into contact with the lid unit side or container~~
~~body. An side, and an annular groove may provided in on the~~
~~outer side of the seal piece for and absorbing elastic~~
~~deformation of the seal piece.~~

25 ~~With the structure, the seal piece is in contact with~~
~~the lid unit side or the container body side, and elastic~~
~~deformation by the contact of the seal piece is absorbed by~~
~~the annular groove.~~

~~According to a tenth aspect of the invention, there is provided a thin plate supporting container comprising a container body for housing therein a plurality of thin plates, a lid unit for closing the container body, and slotted plates~~
5 ~~provided on side walls facing each other in the container body and supporting the thin plates housed on the inside from both sides, wherein a bottom plate of the container body is set so that a~~ A gap between the bottom plate (wall) of the container body and the lower end of the thin plates housed
10 in the container body is preferably set at the minimum, enough sufficient to absorb shock.

With the above-described structure, since the gap between the bottom plate of the container body and the lower periphery~~end~~ of the thin plate housed in the container body
15 is set at the minimum, enough to absorb shock, the size of the container body can be reduced.

~~According to an eleventh aspect of the invention, in the thin plate supporting container according to the tenth aspect, height of the container body is reduced only by an~~
20 ~~amount corresponding to reduction in the gap between the bottom plate of the container body and the lower end of the thin plate housed in the container body.~~

~~With the structure~~ Accordingly, since the height of the container body is reduced ~~only~~ by an amount corresponding to reduction in the gap between the bottom plate of the
25 container body and the lower end of the thin plates housed in the container body, the size of the thin plate supporting container can be reduced. Consequently, when packed,

cushioning between the bottom of the thin plate supporting container and a packing box can be increased, and the impact absorbing capability in the case of an impact of a fall ~~or the like~~ can be largely increased~~improved~~.

5 According to ~~another~~^{a twelfth} aspect of the invention, there is provided a thin plate supporting container comprising a container body for housing therein a plurality of thin plates, a lid unit for closing the container body, and slotted plates provided on side walls facing each other in the container
10 body and supporting the housed thin plates ~~housed on the inside~~ from opposing~~both~~ sides, wherein an attaching/detaching mechanism is provided for detachably attaching either or both~~any one~~ of a top flange for engagement by a carrying mechanism and a handle to be held by the user, ~~or both~~ to
15 the container body, ~~the~~ The attaching/detaching mechanism has a sliding and supporting means for slidably engaging~~supporting~~ the container body with ~~and~~ the top flange or handle so that the two members are slidable relative to~~on~~ each other, and locking means for locking the two members.
20 ~~The slidably supported by the sliding and supporting means so as not to be deviated from each other, the~~ sliding and supporting means includes a supporting portion provided on~~for~~ one of members and a sliding portion which is provided on~~for~~ the other member for insertion~~and is to be inserted~~ into the
25 supporting portion from the front side to the inner side. ~~The, the~~ locking means has a locking projection provided on~~for~~ the one of the members ~~or the other member~~, and a locking pawl provided on~~for~~ the other member for engaging~~or one of~~

members, ~~the locking pawl is constructed by a contact portion~~
~~which comes into contact with the locking projection. A and~~
~~a supporting bar supports a portion for supporting the contact~~
~~and extends portion, and the supporting bar portion is formed~~
5 ~~so as to extend to the other side member and to the front~~
~~side of the sliding and supporting means. The contact carried~~
~~by the support bar on the one member engages a locking~~
~~projection on the other member to prevent~~

~~With the structure, the supporting bar portion is formed~~
10 ~~so as to extend to the other side member and to the front~~
~~side of the sliding and supporting means. Therefore, in the~~
~~case where a strong force is applied in the direction of making~~
~~the top flange or the like come off, by the support of the~~
~~supporting bar portion, disengagement of the top flange or~~
15 ~~handle the like is prevented. Thus, even if a strong impact~~
~~is given to the top flange or the handle like, the top flange~~
~~or the handle like does not come off.~~

~~According to a thirteenth aspect of the invention, in~~
~~the thin plate supporting container according to the twelfth~~
20 ~~aspect, the The contact portion of the locking pawl is~~
~~preferably provided at the digital end, opposite on the side~~
~~of the other side member than the base end portion of the~~
~~supporting bar so that portion.~~

~~With the structure, since the contact portion of the~~
25 ~~locking pawl is provided on the side of the other side member~~
~~than the base end portion of the supporting bar portion, the~~
~~contact portion is pressed strongly pressed against the~~
~~locking projection. Consequently, even if a strong force is~~

applied by an impact or the like, the contact ~~portion~~ does not ~~release~~~~come off~~ from the locking projection.

~~In yet another~~~~According to a fourteenth~~ aspect of the invention, ~~in the thin plate supporting container according to the twelfth or thirteenth aspect,~~ two supporting portions and two sliding portions of the sliding and supporting means are provided in parallel, and each of the interval between the supporting portions and the interval between the sliding portions is set to be small on the front side and large~~to be large~~ on the inner side.

~~With the structure, since the interval on the front side is set to be small and the interval on the inner side is set to be large, so that~~ the sliding portion can be easily fit in the supporting portion.

~~According to a fifteenth aspect of the invention, the~~~~The~~ thin plate supporting container ~~according to any of the twelfth to fourteenth inventions~~may further includes guide rails for guiding two members supported by the sliding and supporting means for sliding and~~so as to slide and performing~~ positioning in a direction orthogonal to the sliding direction.

~~With the structure, by being guided by the guide rails,~~ whereby the two members supported by the sliding and supporting means can be easily attached/detached.

According to still another~~a sixteenth~~ aspect of the invention, there is provided a thin plate supporting container comprising a container body for housing therein a plurality of thin plates, a lid unit for closing the container body, and slotted plates provided on side walls facing each other

in the container body and supporting the housed thin plates
~~housed on the inside~~ from ~~both~~opposing sides, wherein the
lid unit is provided with a latch mechanism for fixing the
lid unit to the container body, the latch mechanism including
5 ~~is constructed by~~ a first arm for engagement with ~~locked to~~
the container body ~~side~~ to fix the lid unit to the container
body, and a second arm swingably supported by the lid unit
and swingably supporting the first arm. The ~~the~~ first arm
has ~~is constructed by~~ a locking pawl at which is provided in
10 ~~a base end portion for engaging of the first arm and comes~~
~~into contact with the container body side, and a grip which~~
~~is provided at a tip portion and is positioned at~~ in a side
of the lid unit for lifting when in a state where the first
and second arms swing to their ~~the~~ limit positions, ~~and the~~
15 ~~second arm swings to a position where the locking pawl at~~ of
the base end portion of the first arm is ~~does not in~~ come into
contact with the container body in a state where the first
arm swings to the limit.

To attach ~~With the structure, at the time of attaching~~
20 ~~the lid unit to the container body, the user grips the grips~~
~~of the first arms to lift the lid unit up and covers the container~~
~~body with the lid unit from above. The grips are~~ is positioned
to the ~~on a side~~ sides of the lid with ~~unit in a state where the~~
first and second arms swung to their ~~swing to each limit~~
25 positions, so that the user can easily lift the lid unit and
cover the container body with the lid unit. The grips are
then ~~By still gripping the grip, the grip is pushed downward~~
to bring the. ~~The locking pawl at~~ in the base end portion of

~~each~~the first arm ~~comes~~ into contact with the container body,
~~thereby fixing side and~~ the lid unit ~~is fixed~~ to the container
body. ~~To detach~~~~In the case of detaching~~ the lid unit from
the container body, the user grips the grips of the first
5 arms and pulls the grips away from the container body, whereby
~~the~~~~to the opposite sides.~~ The locking pawl ~~at~~~~in~~ the base end
~~portion of the~~each first arm is detached from the container
body side and the lid unit is disengaged. Thus detached,~~In~~
this state, ~~the user still grips the grips to lift the lid~~
10 ~~unit.~~ ~~At this time,~~ the locking pawl ~~at~~~~in~~ the base end is
~~in~~~~portion swings to a position wherein which~~ it does not come
into contact with the container body and, consequently, ~~in~~
~~a state where the second arm makes the first arm swing to~~
~~the limit.~~ ~~Consequently,~~ the lid unit can be easily detached.
15 ~~In such a manner, the lid unit can be easily attached/detached.~~
~~According to a seventeenth aspect of the invention,~~
~~in the thin plate supporting container according to the~~
~~sixteenth aspect~~At their limit positions, the first arm is
at~~open up to~~ 90° with respect to the second arm and the second
20 arm is at~~open up to~~ 35° with respect to the container body.
~~With the configuration, the grip is supported in a side~~
~~of the lid unit and is in a position at which the grip is~~
~~easily gripped, and is open to a position where the locking~~
~~pawl comes not come into contact with the container body.~~
25 ~~According to an eighteenth~~In another aspect of the
invention, there is provided a thin plate supporting container
comprising a container body for housing therein a plurality
of thin plates, a lid unit for closing the container body,

and slotted plates provided on side walls facing each other in the container body for supporting the housed thin plates ~~housed on the inside from opposing both~~ sides, wherein a thin plate pressing member is provided on the interior~~back~~ face of the lid unit, ~~the thin plate pressing member~~ for supporting the thin plates by pressing against their~~an~~ upper peripheries~~portion of a thin plate housed in the container body~~ when the lid unit is attached to the container body. Fitting, ~~fitting~~ grooves in each ~~of which~~ the thin plates are individually fitted~~is fit~~ and supported are provided in~~for~~ the thin plate pressing member, the fitting ~~grooves~~ being formed at an acute angle so as to catch the periphery~~ies~~ of the thin plates.-

~~With the structure, the fitting groove for supporting a thin plate is provided for the thin plate pressing member and is formed at an acute angle.~~ Consequently, even when a strong impact is received by~~given to~~ the thin plate supporting container, because the periphery of the thin plate is lodged~~withine~~~~caught by~~ the fitting groove formed at an acute angle, rotation of the thin plate is prevented, and the thin plate can be reliably supported.

According to yet another~~a nineteenth~~ aspect of the invention, there is provided a thin plate supporting container comprising a container body for housing therein a plurality of thin plates, a lid unit for closing the container body, and slotted plates provided on side walls facing each other in the container body and supporting the housed thin plates ~~housed on the inside from opposing both~~ sides, wherein a thin

plate pressing member is provided on the interior~~back~~ face of the lid unit, ~~the thin plate pressing member~~ for supporting the thin plates by pressing against an upper portion of ~~a~~ thin plates housed in the container body when the lid unit is
5 attached to the container body. The, ~~the~~ thin plate pressing member has a number of pressing bands which are arranged in parallel for independently contacting, ~~comes into contact~~ with the periphery of ~~a~~ the thin plate, thereby individually supporting and supports the thin plates at predetermined
10 intervals. The ~~one by one, and the~~ pressing bands are formed in a wavy~~wave~~ shape along the peripheries of the thin plates. Since

~~With the structure, since~~ the pressing bands are formed along the peripheries of the thin plates, even when ~~a~~ the
15 thin plate is displaced, it does not enter ~~a~~ the gap between the pressing bands.

According to another~~at twentieth~~ aspect of the invention, there is provided a thin plate supporting container comprising a container body for housing therein a plurality of thin plates,
20 a lid unit for closing the container body, and slotted plates provided on side walls facing each other in the container body for supporting the housed thin plates ~~housed on the inside~~ from opposing both sides, wherein body positioning means for positioning the ~~whole~~ container body is provided on the bottom
25 of the container body (when disposed transversely), ~~and the~~ body positioning means including~~includes~~ V-shaped groove plates ~~pieces constructing V-shaped grooves~~ provided in three positions and extending in three directions on the bottom

of the container body, and supporting stands for supporting the V-shaped groove plates ~~pieces~~.

~~With the structure, since~~ Since the V-shaped groove plate piece is attached as a separate member to the supporting stand of the body positioning means, the V-shaped groove plate can be fabricated ~~piece made~~ of a material suitable for mating with ~~suited to the material of~~ the projection on a container handling device. ~~the other side can be easily attached.~~

~~According to a twenty first aspect of the invention, in the thin plate supporting container according to the twenties aspect, the~~ The V-shaped groove plate piece is made of a material having low surface frictional resistance. Thus

~~With the structure, when the projection on the other side is fit in the V-shaped groove plate~~ ~~piece made of a~~ the material having low surface frictional resistance, the projection smoothly slides on the V-shaped groove plate into ~~piece and is fit in the accurate position and.~~ ~~Thus,~~ accurate positioning can be achieved.

~~According to a twenty second aspect of the invention, in the thin plate supporting container according to the twenties or twenty first aspect, the~~ The V-shaped groove plate piece is detachably mounted on ~~attached to~~ the supporting stand.

~~With the structure, since the V-shaped groove plate piece is detachably attached,~~ so that the V-shaped groove plate piece can be easily replaced in accordance with the material of the projection ~~on the other side.~~

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a sectional perspective view ~~showing of~~ a thin plate supporting container ~~of according to~~ an embodiment of the present invention.

5 FIG. 2 is a perspective view ~~showing of~~ the thin plate supporting container ~~of according to~~ the embodiment of FIG. 1 ~~the present invention.~~

FIG. 3 is a perspective view showing ~~the, from bottom of side,~~ the thin plate supporting container ~~of according to~~ the embodiment of FIGS. 1 and 2 ~~the present invention.~~

FIG. 4 is a perspective view ~~of showing~~ a supporting stand of a body positioning element ~~means.~~

FIG. 5 is a perspective view showing ~~of a state where~~ a V-shaped groove plate ~~piece is attached to~~ the supporting stand ~~of the body positioning means.~~

FIG. 6 is a perspective view showing the top of the V-shaped groove plate ~~piece of~~ the body positioning means.

FIG. 7 is a perspective view showing, ~~from the bottom of side,~~ the V-shaped groove plate piece of the body positioning means.

FIG. 8 is a sectional perspective view showing ~~a state where~~ the attachment of the V-shaped groove plate ~~piece is attached to~~ the supporting stand of the body positioning means.

FIG. 9 is a perspective view showing a top flange ~~of according to~~ the embodiment of FIG. 1 ~~the present invention.~~

FIG. 10 is a perspective view showing, ~~from the bottom of side,~~ the top flange ~~of according to~~ the embodiment of FIG. 1 ~~the present invention.~~

FIG. 11 is a partial perspective view showing the container body ~~of according to the embodiment of FIG. 1 the present invention.~~

5 FIG. 12 is a perspective view showing the top flange side of an attaching/detaching mechanism ~~of according to the embodiment of FIG. 1 the present invention.~~

FIG. 13 is a sectional perspective view showing ~~attachment of a state where the top flange is attached to the container body.~~

10 FIG. 14 is ~~another~~ a perspective view of attachment ~~of showing a state where the top flange is attached to the container body.~~

FIG. 15 is ~~yet another~~ a perspective view ~~of a main portion~~ showing attachment of a state where the top flange is attached
15 to the container body.

FIG. 16 is a cross-sectional view ~~of a main portion~~ showing attachment of a state where a slotted plate is attached to the container body.

FIG. 17 is a perspective view ~~of showing~~ the slotted
20 plate.

FIG. 18 is a ~~planar plan~~ view ~~of showing~~ the slotted plate.

FIG. 19 is an enlarged ~~planar plan~~ view ~~of showing~~ the slotted plate.

FIG. 20 is a perspective view showing an upper attachment
25 fitting ~~portion~~ of the container body.

FIG. 21 is a perspective view showing a lower attachment fitting ~~portion~~ of the container body.

FIG. 22 is an enlarged ~~planar plan~~ view showing the upper

attachment fitting portion of the container body.

FIG. 23 is an enlarged perspective view showing the lower attachment fitting portion of the container body.

FIG. 24 is a perspective view of showing a thin plate pressing member.

FIG. 25 is a planar plan view of showing the thin plate pressing member.

FIG. 26 is a cross--sectional view of showing a fitting groove in the thin plate pressing member.

FIG. 27 is a perspective view of showing a latch mechanism.

FIG. 28 is a perspective view of showing a stopper of the latch mechanism.

FIG. 29 is a partial cross--sectional view ~~of a main portion~~ showing a gasket.

FIG. 30 is a partial cross--sectional view ~~of a main portion~~ showing a base end supporting portion of the gasket.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Embodiments of the invention will be described hereinbelow with reference to the appended drawings. TheA thin plate supporting container of the present invention is suitable for~~a container used in processes of~~ housing, storing, transporting, and producing thin plates such as semiconductor wafers, storage disks, and liquid crystal glass substrates. In the description which follows, a~~embodiment, a thin film supporting~~ container for housing semiconductor wafers will be described by way of~~as an~~ example.

A thin plate supporting container 1 ~~according to an embodiment has~~, as shown in FIGS. 1 to 3, includes a container body 2 for housing therein a plurality of semiconductor wafers S (refer to Fig. 16), two slotted plates 3 provided on opposite
5 side walls in the container body 2 and supporting the housed semiconductor wafers S from both sides, a lid unit 4 for closing an opening 2F of the container body 2, a top flange 5 for engagement with ~~held by~~ an arm of a transporting apparatus (not shown), and a handle 6 ~~for carry which is gripped by~~
10 the user for carrying ~~when the user carries~~ the thin plate supporting container 1.

The container body 2 is formed in an almost cubiceube shape. The container body 2 comprises four side walls 2A, 2B, 2C, and 2D serving as peripheral walls and a bottom plate
15 2E ~~when the container body 2 is set longitudinally (in a state where the bottom plate 2E is down)~~, and an opening 2F is provided at the top of the container body 2. Ribs 9 for reinforcement ~~and the like~~ are provided on ~~for~~ each of the side walls 2A, 2B, 2C, and 2D. When the container body 2 is
20 positioned ~~installed so as to face a robot (not shown) for carrying wafers in a manufacturing line of semiconductor wafers S or the like~~, it is positioned with accuracy and set transversely on a stand ~~transversely (the state of as shown in Fig. 2)~~. On the outside of the side wall 2A (which serves as the bottom) is provided ~~transversely~~, body positioning
25 means 11 ~~of the thin plate supporting container 1 is provided~~. The top flange 5 is detachably mounted ~~attached~~ by an attaching/detaching mechanism 12 to the outside of the side

wall 2B serving as the ~~tope~~ceiling transversely. ~~To~~On the ~~outside~~exterior of the side walls 2C and 2D are detachably mounted~~serving as side walls transversely~~, the handles 6 for ~~carrying~~carry ~~are detachably attached~~.

5 The body positioning means 11 is in the form
~~of constructed by~~, as shown in Fig. 3, three V-shaped fitting
grooves 13. The fitting grooves 13 ~~include~~are a vertically
oriented first fitting groove 13A ~~aligned in the vertical~~
~~direction of the container body 2~~ and second and third fitting
10 grooves 13B and 13C ~~each inclined at~~by an angle (almost 60
degrees) ~~to from the vertical direction of the container body~~
2. The three grooves 13 are set to have high dimensional
precision in accordance with a standard. When the fitting
grooves 13A, 13B, and 13C of the body positioning means 11
15 are mated~~fit~~ with fitting projections (not shown) of a stand
used in a semiconductor fabricating process, the thin plate
supporting container 1 is ~~mounted in~~accurately positioned,
and the semiconductor wafers S may be removed~~are taken in~~
or inserted by a wafer carrying robot.

20 Each of the fitting grooves 13 ~~includes~~is constructed
~~by~~ a V-shaped groove plate ~~piece~~ 15 and a supporting stand
16.

~~— The V-shaped groove plate piece 15 is a member as a~~
~~component of the fitting groove 13.~~ The V-shaped groove plate
25 ~~piece 15 is constructed by~~includes a frame 17, inclined plates
18, and locking pawls 19.

 The frame 17 ~~supports~~is a member for supporting the
inclined plate 18 and the locking pawl 19. The frame 17 is

formed in a rectangular shape so as to mate~~fit~~ with a notch 21C for engagement with a fitting~~of the~~ supporting stand 16, ~~which will be described later.~~ In ~~b~~Both end portions in the ~~longitudinal direction of the frame 17,~~ are provided with supporting plate fitting notches 17A which seat on~~fit with~~ end ~~portion~~-supporting plates 22 of the supporting stand 16 ~~which will be described later to stably support the whole container are provided.~~ The inclined plates 18 are members serving as inclined surfaces of the fitting groove 13. Two
10 inclined plates 18 are provided for each~~one~~ frame 17 and~~-~~ In a state where the base end portion of each of the inclined plates 18 ~~is fixed to the frame 17,~~ the inclined plates 18 extend downward to the inside. The thickness of the inclined plate 18 is set in relation to~~with~~ the supporting stand 16
15 so that the upper surface (the upper surface in Fig. 6) has a predetermined dimension. The V-shaped groove plate piece 15 is made of a material having a low surface frictional resistance, so that a fitting projection of a mounting stand used in the semiconductor fabricating process slides smoothly
20 into the V-shaped groove for~~to perform~~ accurate positioning of the thin plate supporting container 1. An example of the material is PBT.

The locking pawls 19 (FIG. 6) are members for fixing the V-shaped groove plate ~~piece~~-15 to the supporting stand
25 16. The locking pawls 19 extend from the center portion of the inclined plate 18 downward to the inside. The tip of the locking pawl 19 extends inward,~~is folded back to the~~ perpendicular to its length, to form a catch~~direction, and~~

a ~~nail~~ portion 19A which engages at the tip of the locking
~~pawl 19 is locked by~~ a locking projection 23 of the supporting
stand 16 ~~which will be described later~~. In such a manner,
the V-shaped groove plate ~~piece~~ 15 is detachably fitted
5 ~~on~~ ~~attached to~~ the supporting stand 16. ~~Selectively, the~~ The
V-shaped groove plate ~~piece~~ 15 is formed of a material ~~(material~~
having low surface frictional resistance ~~)~~ matched with the
material of the fitting projection of the mounting stage used
in the semiconductor fabricating process so that is attached.
10 ~~It makes the fitting projection on the other side can~~ easily
slide into the V-shaped groove plate ~~piece~~ 15 to provide ~~perform~~
accurate positioning.

The supporting stand 16, which serves to ~~is a member~~
~~for supporting~~ the V-shaped groove plate ~~piece~~ 15, includes.
15 ~~The supporting stand 16 is constructed by an inclined~~ ation
~~supporting~~ plates 21, an end-portion supporting plates 22,
and a locking projection 23.

The inclined ~~ation~~ supporting plates 21 ~~is a member for~~
accurately positioning and supporting the inclined plates
20 18 of the V-shaped groove plate piece 15. Four plate pieces,
each having a U shape in plan view, are arranged and have
inclined faces which ~~21A formed along the V-shaped groove on~~
~~the inner side of the four plate pieces~~ come into direct contact
with and support the inclined plates 18 of the V-shaped groove
25 plate ~~piece~~ 15. The dimensions of the inclined face 21A are
accurately set so that the upper surface of the inclined plate
18 of the V-shaped groove plate piece 15 supported by the
inclined faces 21A, is in a ~~come to have~~ predetermined

~~position dimensions~~. Since ~~mainly~~ the tip portion of the fitting projection of the mounting stand ~~used in the semiconductor fabricating process~~ comes into contact with the inclined plate 18, an inner portion 21B of the inclined face 21A having a U shape in plan view is finished to have more accurate dimensions. ~~In~~ At an upper end portion of each the inclined ~~ation~~ supporting plate 21 is a, the fitting notch 21C ~~is provided~~. The fitting notch 21C fits ~~is a notch with which the frame 17 of the V-shaped groove plate piece 15 fits.~~

5

10 The V-shaped groove plate ~~piece 15~~ is supported at ~~by~~ eight fitting notches 21C.

The upright end-portion supporting plates 22 ~~are members for supporting both ends in the longitudinally opposed ends direction~~ of the V-shaped groove thin plate ~~piece 15~~ which is fitted with ~~fits with the fitting notches 21C of the inclined~~ ~~ation~~ supporting plates 21. ~~The end-portion supporting plate 22 is formed as an upright plate and is provided for each of the both ends of the inclination supporting plates 21.~~ The upper end portions of the end-portion supporting plates 22 fits ~~with the supporting plate fitting into the notches 17A of the frame 17 of the V-shaped groove plate 15, thereby stably supporting the V-shaped groove plate piece 15 while preventing displacement a deviation in the longitudinal direction of the V-shaped groove plate piece~~

15

20

25 15.

~~The locking projection 23 is a member for supporting the V-shaped groove plate piece 15.~~ The locking projection 23 is provided centrally ~~in the center portion~~ between the

inclined supporting plates 21. The upper end portion of the locking projection 23 is enlarged for engagement and locked by the naillcatch portion 19A of the locking pawl 19 of the V-shaped groove plate ~~piece~~ 15.

5 The top flange 5 ~~is constructed by~~, as shown in Figs. 9 and 10, has a flange portion 25 and a body portion 26. The flange portion 25 is designed ~~a member~~ to be gripped by an arm (not shown) of the transporting apparatus for transport of. ~~In a factory or the like, the top flange 5 is gripped~~
10 ~~by the arm of the transporting apparatus and the thin plate supporting container 1 is transported.~~ The body portion 26 ~~is a member for supporting~~ the flange portion 25 and serves to attaching it to the container body 2. ~~On the~~ The back face of the body portion 26 is engaged by one of the members of
15 the attaching/detaching mechanism 12 which will be described below ~~later is provided.~~

In the center ~~portion~~ of the side wall 2B of the container body 2 is located, the other member of the attaching/detaching mechanism 12 for detachably attaching securing the top flange
20 ~~5 is provided.~~ The attaching/detaching mechanism 12 is constructed as shown by Fig. 1 and Figs. 11 to 15. More
sSpecifically, the attaching/detaching mechanism 12 includes ~~is constructed by~~ a sliding and supporting means 27, locking means 28, and guide rails 29.

25 ~~The sliding and supporting means 27 is a member for slidably supporting the container body 2 and the top flange 5.~~ The sliding and supporting means 27 includes ~~is constructed~~ by a supporting portion 30 provided on the container body

2 ~~side~~ and a sliding portion 31 which is provided on the top
flange 5 ~~side~~ and which is inserted into the supporting portion
30 from the front side ~~to the inner side~~ (from the end on
the right side toward to the end on the left side in Fig. 11).
5 The supporting portion 30 is formed ~~made~~ by two rail members
arranged in parallel on the outer surface of the side wall
2B of the container body 2. ~~In~~ The rail members, have grooves
which ~~are open outward, i.e. are~~ (the grooves provided on
the outer sides of the two rail members and open ~~to opposite~~
10 each othersides) ~~are formed~~. The sliding portion 31 is made
of spaced ~~by~~ rail members located at ~~provided in~~ positions
corresponding to the supporting portions 30 and having in the
~~body portion 26 of the top flange 5. In the rail members,~~
grooves which ~~are open to the inside (facing)~~ are provided.
15 The supporting portion 30 and the sliding portion 31 are set
so that the interval between the rail members on the front
side (the right side in Fig. 11) is narrower than that at
the rear ~~and the interval on the deep side so that is wide.~~
~~With the configuration,~~ the sliding portion 31 can be easily
20 engaged with the supporting portion 30.

The locking means 28 serves to lock ~~is a member for locking~~
the container body 2 and the top flange 5 together so as not
to move relative to ~~be deviated from~~ each other, when ~~which~~
are slidably supported by the sliding and supporting means
25 27. The locking means 28 is formed ~~constructed~~ by locking
projections 33 ~~provided on the container body 2 side~~ and locking
pawls 34 provided on the top flange 5 ~~side~~. Two locking
projections 33 are provided on ~~for~~ the side wall 2B. Each of

the locking projections 33 is centrally located~~provided in~~
~~the center between the~~both ends of the two rail members of
the supporting portion 30. The surface of the locking
projection 33 facing ~~to the~~ inner side (the left side in Fig.
5 11) serves as a perpendicular contact surface, and the locking
projection 33 prevents~~supports~~ the locking pawl 34 from
movement toward~~so as not to be deviated to~~ the front side
(the right side in Fig. 11).

The inner-side and front-side locking pawls 34 and 34B
10 engage~~is a member which is locked by~~ the locking projections
33 to prevent the top flange 5 from coming off and extend
from. ~~Two locking pawls 34 are provided for the body portion~~
26 of the top flange 5. ~~Specifically, an inner-side locking~~
~~pawl 34A and a front-side locking pawl 34B are provided.~~ The
15 inner-side locking pawl 34A includes a catch~~is constructed~~
~~by a contact portion 36 which engages~~~~comes into contact with~~
the locking projection 33 on the top wall 2~~inner-side~~, and
a supporting bar ~~portion 37~~ for supporting the catch~~contact~~
~~portion 36~~. The contact ~~portion 36~~ comes into
20 engagement~~contact~~ with the locking projection 33 at~~by using~~
~~a surface facing to the front as a perpendicular contact face~~
to thereby prevents~~support~~ the top flange 5 from movement~~so~~
~~as not to be deviated to the front side.~~ ~~The supporting bar~~
~~portion 37 is formed so as to extend to the container body~~
25 ~~2-side and also to the inner side.~~

The front-side locking pawl 34B includes~~is constructed~~
by a catch~~contact portion 38 which engages~~~~comes into contact~~
with the locking projection 33 on the front side and a

supporting bar ~~portion~~ 39 for supporting the catcheontaet
~~portion~~ 38. The catcheontaet ~~portion~~ 38 comes into contact
with the locking projection 33 ~~atby using~~ a perpendicular
surface facing ~~to the front side as a perpendicular contact~~
5 face to thereby support the locking pawl 34B so as ~~not to~~
prevent movement ~~be deviated to the front side~~. The supporting
~~bar portion 39 is formed so as to extend to the container~~
~~body 2 side and also to the front side~~. By the supporting
~~bar portion 39, the contact portion~~ The catch 38 is
10 ~~closer provided near to the container body portion 262 side~~
~~more than to the distal base end portion of the supporting~~
~~bar portion 39~~. Accordingly, in the case where a force is
received which tends to dislodge ~~applied to the top flange~~
~~5 in the direction of making the top flange 5 come off~~, the
15 ~~catcheontaet portion~~ 38 is pressed strongly against the
locking projection 33. Thus, even if a strong force is applied
by an impact or the like, the catcheontaet ~~portion~~ 38 is
reliably prevented from releasing ~~coming off~~ from the locking
projection 33. Accordingly, ~~by the supporting bar portion~~
20 ~~39, resists~~ detachment of the top flange 5 ~~is suppressed~~.

The guide rails 29 serve to position the top flange
~~5 are members for performing positioning~~ in a direction
orthogonal to the ~~sliding direction of guided by guiding~~
sliding of the top flange 5 ~~supported to the container body~~
25 ~~2 by the sliding and supporting means 27~~. The guide rails
29 include ~~are constructed by~~ a fitting rail 29A and a receiving
rail 29B. Two fitting rails 29A, each a single ~~constructed~~
~~by one rail member,~~ are provided on the inner side of the

two rails members ~~of the supporting portion 30, on in~~ the side wall 2B of the container body 2. The receiving rails 29B each consists of ~~is constructed by~~ two rail members sandwiching ~~at the~~ fitting rail 29A ~~therebetween from both sides~~ and depend from ~~is provided on~~ the top flange 5 ~~side opposite to~~ the fitting rail 29A. The fitting rails 29A and the receiving rails 29B are provided in parallel with each other. Accordingly, the fitting rails 29A, each fitted between ~~fits in the~~ receiving rails 29B provide a slidable mount for ~~to support sliding from the front side to the inner side and sliding from the inner side to the front side of the top flange 5, thereby enabling the top flange 5 to be easily attached/detached to/from the container body 2.~~

As shown in Figs. 2 and 3, each ~~the~~ handle 6 comprises two gripping bars ~~rods~~ 41 and 42. The gripping rods ~~bars~~ 41 and 42 are set at angles different from each other. Accordingly, the user selectively grips one of the two gripping rods ~~bars~~ 41 and 42 according to the orientation (portrait or landscape orientation) of the thin plate supporting container 1 ~~at the time of carry~~. The angle of one of the gripping rods ~~bars~~ 41 and 42 is set to optimize carrying the ~~an angle which is optimum to the case where the thin plate supporting container 1 is carried longitudinally and the other angle is set to optimize carrying an angle which is optimum to the case where the thin plate supporting container 1 is carried transversely.~~ Specific angles are properly set according to various factor ~~seconditions~~ such as the size, weight, and the like of the thin plate supporting container

1. The handles 6 ~~are~~^{is} detachably mounted on~~attached to~~ each of the side walls 2C and 2D by an attaching/detaching mechanism having the same structure as that of the attaching/detaching mechanism 12.

5 The bottom plate 2E ~~has~~^{comprises} legs 44 and a cover plate 45 as shown in Figs. 3 and 16. The legs 44 are designed ~~to members for~~ supporting the container body 2. The legs 44 are constructed as bar projections ~~only by projected bars formed along the overall width of~~ two opposite sides of the bottom
10 plate 2E. The cover plate 45 is a member for covering the lower sides of the semiconductor wafers S housed in the container body 2. The cover plate 45 ~~is provided so as to be curved~~^s downward between the legs 44. The cover plate 45 is set so that the gap "t" between the lower ends of the
15 semiconductor wafer S housed in the container body 2 and the cover plate 45 ~~is within~~^{becomes} a certain range, namely, the gap is set to a minimum ~~capable of~~^{so as to} fully absorbing ~~a~~ the shock, for example, 3 mm, for the following reason. Since the precision of installation ~~precision~~ and supporting
20 rigidity of the slotted plates 3 ~~which will be described later~~ have been improved, even in case of a strong impact due to a fall or the like of the thin plate supporting container 1, the semiconductor wafers S ~~are~~^{can be} supported with sufficient strength to minimize ~~a~~ downward
25 displacement ~~deviation can be suppressed~~. In addition, the height of the container body 2 is decreased and the size is reduced ~~only~~ by an amount corresponding to the reduction in the gap between the bottom plate 2E and the lower ends of

the semiconductor wafers S. Consequently, when the thin plate supporting container 1 is packed, the gap between the bottom of the thin plate supporting container 1 and a packing box is increased as compared with the conventional case, so that cushioning can be increased and the capability of absorbing a shock due a fall or the like can be largely improved.

In an upper end portion of the container body 2, as shown in Fig. 1, a lid unit receiving step (shoulder) 47, with which the lid unit 4 fits, is provided. The lid unit receiving step 47 is formed by enlarging the upper end portion of the container body 2 to the dimensions of the lid unit 4. The lid unit 4 is attached to the lid unit receiving step 47 by fitting with the inner side of a perpendicular plate portion 47A of the lid unit receiving step 47 and coming into contact with a horizontal plate portion 47B. Further, a gasket 80 (refer to Fig. 29) attached to the under face of the lid unit 4 comes into contact with the horizontal plate portion 47B, thereby keeping air tightness in the thin plate supporting container 1. On the inside of the perpendicular plate portion 47A of the lid unit receiving step 47, a fitting hole 48 is provided for fixing a special lid unit (not shown), used in the semiconductor fabricating process, to the container body 2 ~~side~~. The fitting holes 48 are provided at four corners of the lid unit receiving step 47. The position and shape of the fitting hole 48 are designed to properly mate with ~~set according to~~ the special lid unit used in the semiconductor fabricating process.

The slotted plate 3 is, as shown in Fig. 1 and Figs.

16 to 23, a member for supporting the housed semiconductor wafers S from ~~both opposing~~ sides. ~~The~~ A slotted plate 3 is provided for each of the opposite side walls 2C and 2D ~~of~~ in the container body 2. ~~The~~ Each slotted plate 3 is detachably
5 ~~fixed~~ attached to the inside of the container body 2. ~~Each~~ The slotted plate 3 ~~includes~~ is constructed mainly by a number of plate ~~elements~~ pieces 50, disposed in parallel at a predetermined interval and supporting the wafers S
10 ~~individually~~ one by one, and a supporting plate 51 for integrally joining and supporting the plate ~~elements~~ pieces 50 ~~in a state where the plate pieces 50 are disposed in parallel at predetermined intervals.~~

~~Each~~ The plate ~~element~~ piece 50 ~~is provided so as to~~ extends from the inner side of the container body 2 to an
15 outlet/inlet port (opening 2F) ~~and has~~ of the semiconductor wafers S. ~~The plate piece 50 is formed so that a portion~~ extending from the inner side to an intermediate position which is curved along the periphery of the semiconductor wafer S and a portion extending from the intermediate position to
20 the opening 2F ~~outlet/inlet port is along the side wall of the container body 2.~~ side. ~~On the inner side and the outlet/inlet port side in the~~ Each plate ~~element~~ piece 50 has, adjacent its opposing ends, thin plate supporting projections 52 for supporting the semiconductor wafers S ~~are provided.~~
25 The thin plate supporting projection 52 closest to opening 2 F ~~on the outlet/inlet portion side is provided around an intersecting~~ extends across the point of intersection of the inner periphery of the plate piece 50 and the periphery of

the semiconductor wafer S. By providing the thin plate supporting projection 52 as close to the outlet/inlet port as much as possible to the opening 2F, the semiconductor wafer S is stably supported.

5 Between ~~adjacent the plate elements pieces~~ 50 on the inner side ~~are~~, a V-shaped grooves 53 (see Fig. 23) ~~is provided~~. When the container body 2 is placed longitudinally, the semiconductor wafer S is fit into the V-shaped groove 53 and comes into contact with the bottom portion of the V-shaped
10 groove 53 and is thereby centered. ~~The semiconductor wafer S is supported in a center portion.~~

Two handles 54 are provided on the upper portion of the slotted plate 3 to enable a. ~~The handles 54 are portions grabbed by the user to lift the slotted plate 3.~~ The slotted
15 plate 3 is lifted by taking the two handles 54 between the user's fingers.

~~The~~ Supporting plates 51 are provided in three positions, the innermost side (lower left side in Fig. 17), an intermediate position, and ~~an~~ inlet side (upper
20 right side in Fig. 17) of each plate element 50, and integrally support the plate elements 50.

~~The~~ A slotted plate 3 is detachably fixed to each of the side walls 2C and 2D which face each other in the container body 2 by ~~an~~ upper fitting means 55 and a lower fitting
25 means 56.

The upper fitting means 55, which attaches ~~is a member for supporting~~ the upper portion of the slotted plate 3 to the container body 2, includes. ~~The upper fitting portion~~

~~55 is constructed by an upper fitting lugspiece 57 on the~~
~~side walls of the container body 2 (Fig. 20) and an upper~~
~~receiving mounting piece 58 on the slotted plate 3 (Fig. 17).~~
TheAn upper fitting lugspiece 57 is provided for each of the
5 side walls 2C and 2D ~~which face each other in the container~~
~~body 2.~~ A step 59 (Fig. 20) is provided ~~at in~~ an intermediate
position ~~on in the vertical direction of each of the side walls~~
2C and 2D. ~~In the step 59, the~~The four upper fitting pieces lugs
57 are located in the step 59 provided. ~~It is sufficient to~~
10 ~~provide two upper fitting pieces 57 at both ends.~~ According
to the size of the slotted plate 3 ~~or the like~~, three or five
or more upper fitting lugspieces 57 may be provided. The upper
fitting piece 57 is formed in a U shape in plan view (see
Fig. 22). The U-shaped upper fitting lugspiece 57 includes
15 a contact plateface 57A and a supporting legsface 57B. The
contact plateface 57A is ~~a part having a flat forface shape~~
~~which comes into~~ contact with the slotted plate 3 ~~side to~~
~~positionperform positioning of~~ the slotted plate 3 in the
longitudinal direction (the direction from the left inner
20 side to the right front side in Fig. 20), while preventing
turningturn of the slotted plate 3. Since the slotted plate
3 is positioned in the longitudinal direction by using the
contact plateface 57A as a reference, the contact plateface
57A is formed in accurate position and dimensions. The
25 supporting legsface 57B ~~is a part for maintaining a state~~
~~wheresupport~~ the contact plateface 57A ~~is in~~ contact with
the slotted plate 3 ~~side~~.

The upper mounting bracketreceiving piece 58 (Figs.

17, 18, 19 and 22) ~~is a member which fits with the upper~~
fitting lugpiece 57 to longitudinally position perform
~~positioning in the longitudinal direction of the slotted plate~~
3. The upper mounting bracketreceiving piece 58 is provided
5 at in a position on the slotted plate 3 facing the upper fitting
lugpiece 57 in the slotted plate 3. As shown in Fig.
22Specifically, the upper mounting bracketreceiving piece
58 includes slots 58B and projections 61 each having a contactis
~~constructed by a face 58 to be contacted and a face 58B to~~
10 ~~be supported. The face 58A for contactingto be contacted is~~
~~a part with which the contact plateface 57A of the upper fitting~~
lugpiece 57 to longitudinally positioncomes into contact
~~to perform positioning of the slotted plate 3, in the~~
~~longitudinal direction while preventing turningsuppressing~~
15 ~~turn of the slotted plate 3. The face 58A to be contacted~~
~~is formed in a flat face shape and suppresses turn between~~
~~the face 58A and the upper fitting piece 57. The face 58A~~
~~to be contacted is formed at the tip of a projected bar 61~~
~~provided in a position corresponding to the contact face 57A~~
20 ~~of the fitting piece 57 in the slotted plate 3. The contact~~
~~face 58A of the projected bar 61 comes into contact with the~~
~~contact face 57A of the upper fitting piece 57, thereby~~
~~positioning the slotted plate 3 in the longitudinal direction.~~
In this embodimentexample, two projectionsprojected bars 61
25 come into contact with the contact plateface 57A of one upper
fitting lugpiece 57. The reason why the shape of the
projectionprojected bar 61 is designedused is to prevent
shrinkage at the time of molding and improve dimensional

precision.

The slotface 58B receivesto be supported is a member which comes into contact with the supporting face 57B of the upper fitting piecelugs 57 to thereby support the contacted
5 face 58A in a state where the contacted face 58A is in contact with the contact plateface 57A of the upper fitting lugpiece 57. The slotface 58B to be supported is formed in an elongated bracketon the rear face of a band-shaped plate member 63 supported on the slotted plate 3 and includesside by a plurality
10 of spaced plates supporting plate pieces 62. The overall width of the plate member 63 serves as the face 58B to be supported. The supporting face 57B can come into contact with the plate member 63 in any position and can support the slotted plate 3.

15 The contact platefaces 57A and contact face 58A are in contact with each other so as to prevent turning of while being supported by the supporting faces 57A and 57B, thereby preventing deformation such as deflection of the slotted plate 3 and to providedue to turn of the supporting portion of the
20 slotted plate 3 and enabling accurate longitudinal positioning in the longitudinal direction of the slotted plate 3. to be performed. In the The upper fitting meansportion 55 serves, only positioning in the longitudinal direction of to longitudinally position the slotted plate 3 is performed.
25 Positioning in athe other direction perpendicular thereto is providedis carried out by the lower fitting meansportion 56.

The lower fitting meansportion 56 supports is a member

~~for supporting a lower endportion of the slotted plate 3 and
include to the container body 2 side. The lower fitting
portion 56 has a vertical-direction positioning means 65 for
verticalperforming positioning in the vertical direction of~~
5 ~~the slotted plate 3, a horizontal-direction positioning means~~
~~66 for horizontalperforming positioning in the horizontal~~
~~direction, and a front/rear direction-positioning means 67~~
~~for performing positioning in the front/rear~~
~~positioningdirection. The lower fittingBy the means 56,~~
10 ~~serves to accurately position the lower portion of the slotted~~
~~plate 3 is accurately positioned in the vertical, horizontal,~~
~~and front/rear directions and, also in cooperation with the~~
~~upper fitting portion 55, the slotted plate 3 is accurately~~
~~positioned and fixed to the container body 2.~~

15 The vertical-direction positioning means 65 includes
~~ais constructed by a vertical-direction supporting~~
~~bracketpiece 68 on the container body 2 (Fig. 21) and a lower~~
~~plate 69 (Fig. 17) on the slotted plate 3.~~

20 The ~~vertical-direction supporting bracketpiece 68 is~~
~~a member which is provided inon the lower portion of each~~
~~of the side walls 2C and 2D facing each other in the container~~
~~body 2, and receivesfits in the lower portion of the slotted~~
~~plate 3 and comes into contact with the lower end of the slotted~~
~~plate 3, thereby positioning the slotted plate 3 in the vertical~~
25 ~~direction. More specifically, theThe vertical-direction~~
~~supporting platepiece 68 has a fitting notch 68A which~~
~~receivesfits with the slotted plate 3. The dimension in the~~
~~vertical-direction of the fitting notch 68A is accurately~~

set to properly vertically position the slotted plate 3 ~~in the vertical direction.~~

The slotted plate has, depending, a lower plate 69 ~~is a member for accurately positioning the slotted plate 3 in the vertical direction by fitting~~ which mates with the fitting notch 68A of the ~~vertical direction supporting piece~~ bracket 68. ~~The lower plate 69 is a plate member extended downward from the lower portion of the slotted plate 3. Since the lower end face of the lower plate 69 is a part which fits with and in direct contact with the fitting notch 68A, the dimension in the vertical direction is accurately set.~~

The ~~horizontal direction~~ positioning means 66 includes ~~is constructed by~~ a notch 71 formed in the lower plate 69 of slotted plate 3 and a ~~horizontal direction supporting piece~~ 72 positioning projection 72 extending from a sidewall 2C (2D) of the container body.

The notch 71 ~~is provided as a notch which opens downward in the lower plate 69 of the slotted plate 3.~~

The ~~horizontal direction supporting piece~~ positioning projection 72 is located ~~a member which is provided between the vertical direction supporting plates/pieces 68, in each of the lower portions of each of the side walls 2C and 2D, facing each other in the container body 2 and is fit/seated in the notch 71/72 in the lower portion of the slotted plate 3, thereby positioning the slotted plate 3 in the horizontal direction. The horizontal direction supporting piece positioning projection 72 is formed in a wedge shape to mate with~~ which is fit in the notch 71. ~~By the fitting of the~~

~~horizontal-direction supporting piece 72 to the notch 71,~~
~~the slotted plate 3 is positioned accurately in the horizontal~~
~~direction.~~

The front/rear-direction positioning means 67 (Fig.
5 17) includes ~~is constructed by~~ a front/rear-direction-
supporting positioning plate piece 73. The
front/rear-direction supporting plate piece 73 is an
elongated~~made of a band-shaped~~ plate member. ~~The~~
front/rear-direction supporting plate piece 73 ~~made of a~~
10 band-shaped plate member and is provided on a lower portion
of below the slotted plate 3 ~~and so as to~~ extends horizontally
to the back side of the slotted plate 3 where it comes~~and~~
~~come~~ into contact with athe lower portion of a~~each of the~~
side walls 2C or~~and~~ 2D of the container body 2, thereby
15 positioning the slotted plate 3 in the front/rear direction.

~~A stopper~~Stopper means 75 serves to prevent~~is provided~~
~~in the lower portion of the slotted plate 3.~~ The stopper 75
~~is a member for stopping~~ disengagement by upward movement~~to~~
the up of the slotted plate 3. The stopper means 75 is
20 ~~constructed by a locking member~~piece 76 which depends from
the lower edge of the slotted plate 3 (Fig. 17) and a locking
projection 77 which extends from a side wall of the container
body 2 (Fig. 21). The locking member~~piece~~ 76 is formed of
an~~constructed by a band-shaped~~ elastic plate piece 76A which
25 extends~~extended downward~~ from the lower edge~~end~~ of the slotted
plate 3 and ~~a locking~~ pawls 76B provided on ~~the locking~~
~~projection 77~~ side of the elastic plate piece 76A. The locking
projection 77 is engaged~~a member to be locked~~ by the locking

pawls 76B of the locking piece 76. The locking pawl 76B of the locking piece 76 provided between the vertical direction supporting pieces 68 of each of the side walls 2C and 2D fits with the locking projection 77, thereby preventing the slotted
5 plate 3 from coming off by upward movement thereof to the above.

~~The lid unit 4 is structured as~~As shown in Fig. 2 and Figs. 29 to 30, the lid unit 4 is formed in a saucer shape which opens upward.

~~A~~The gasket 80 is provided between the lid unit 4 and the container body 2 and includes. The gasket 80 is
10 constructed by a base end supporting portion 81 and a contact portion 82.

The base end supporting portion 81 is seated within a part which is fit in the fitting groove 4A in the lid unit
15 4 side to support the whole. The base end supporting portion 81 and has a shape an almost trapezoidal shape in cross-section. On the inside of the upper surface of the base end supporting portion 81 is provided, a seal piece 83 seated in and an annular groove 84 are provided. The seal piece 83 extends upward and
20 comes into contact with the lid unit 4 side to keep airtightness. The annular groove 84 is provided on the outer side of the seal piece 83 and absorbs elastic deformation of the seal piece 83.

The contact portion 82 is formed by being expanded from
25 the base end supporting portion 81 into a flange shape. The contact portion 82 has a shape such that its intermediate portion is swollen upward (to the lid unit 4 side) and its outer periphery is folded downward (to the container body

~~2 side), in cross section. The Bent lip portion 82A of swollen~~
~~upward in the contact portion 82 is serves as a portion pressed~~
~~by the lid unit 4, and the periphery thereby comes is a portion~~
~~which comes into contact with the container body 2. side.~~
5 ~~Accordingly, the intermediate portion to be pressed is pressed~~
~~by the lid unit 4 in a state where the periphery is in contact~~
~~with the container body 2 side, and the periphery is closely~~
~~attached to the container body by elastic force of the contact~~
~~portion 82.~~

10 ~~To the sides facing the side walls 2C and 2D of the~~
~~container body 2, of the lid unit 4, a latch mechanism 86~~
~~is provided. The A latch mechanism 86, which serves to fix~~
~~is a mechanism for fixing the lid unit 4 to the container~~
~~body 2, as shown in Fig. 27, includes. The latch mechanism~~
15 ~~86 is constructed by a first arm 87 and a second arm 88. The~~
~~first arm 87 fixes is a member for fixing the lid unit 4 to~~
~~the container body 2 by being directly being locked by a~~
~~receiving portion (not shown) on the container body 2 side.~~
~~The second arm 88 is pivotally a member which is swingably~~
20 ~~supported by the lid unit 4 and pivotally swingably supports~~
~~the first arm 87.~~

~~The first arm 87 has a locking pawl 90 and a grip 91.~~
~~The locking pawl 90 is located at provided for the base end~~
~~portion and comes into contact with the receiving portion~~
25 ~~on the container body 2 side to thereby fix the lid unit 4~~
~~to the container body 2 side. The grip 91 is a member for~~
~~lifting the lid unit 4 and. The grip 91 is formed at the tip~~
~~of the first arm 87, in a shape which is easily gripped by~~

a hand. The first and second arms 87 and 88 are set in a position
at ~~in~~ a side of the lid unit 4 so that the grip 91 is easily
gripped ~~when in a state where each of the first and second~~
arms 87 and 88 have been pivoted to their swing to each limit
5 positions where. ~~It is also set that, in a state where the~~
~~first and second arms 87 and 88 swing to the limit,~~ the locking
pawl 90 ~~at~~ of the base end of the first arm 87 ~~is~~ does not in come
~~into~~ contact with the container body 2. Specifically, in that
limit position, the first arm 87 is open up to 90° with respect
10 to the second arm 88 and the second arm 88 is open up to 35°
with respect to the container body 2. The first arm 87 is
supported at 90° when ~~while~~ its tip ~~side~~ is in contact, ~~in a~~
~~state where the base end portion is pivoted by the L-shaped~~
second arm 88. The second arm 88 is supported at 35° by a
15 stopper 92 (see Fig. 28).

On the back face of the lid unit 4, is a thin plate
pressing member 94 (Figs. 24, 25 and 26) ~~is provided.~~ The thin
plate pressing member 94 serves to press and support ~~is a member~~
~~for pressing and supporting~~ the upper portions of the
20 semiconductor wafers S housed in the container body 2 when
the lid unit 4 is attached to the container body 2.

The thin plate pressing member 94 is formed in an almost
rectangular shape as shown in Figs. 24 to 26. Both
longitudinal ends in the longitudinal direction and the center
25 portion of the thin plate pressing member 94 are fixed to
the back face of the lid unit 4, and the portions between
the both ends and the center portion serve as pressing portions
95. The pressing portion 95 is a member for elastically

pressing and supporting the upper portion of the semiconductor wafer S and is formed of~~constructed by~~ a number of pressing bands 96 arranged in parallel. The pressing band 96 is an elastic member which~~and~~ is formed so as to be curved downward.
5 Further, the pressing band 96 presents a wavy~~is formed in a wave~~ shape in plan view (~~the shape in the state of Fig. 25~~) along the periphery of the semiconductor wafer S to prevent the semiconductor wafer S from entering a~~the~~ gap between the pressing bands 96.

10 The shape ~~of a side face~~ of the pressing band 96, as viewed from the side, is an inverted mountain shape. In two apex positions of the mountain-shaped portion, fitting grooves 97 for supporting each semiconductor wafer S are provided at predetermined intervals. ~~The~~Each fitting groove
15 97 is formed at an acute angle so as to sandwich the periphery of the semiconductor wafer S (Fig. 26).

[Operation]

The thin plate supporting container 1 constructed as
20 described above is used as follows.

In a state where a number of semiconductor wafers S have been placed~~are inserted~~ in the container body 2 and the lid unit 4 is attached, the thin plate supporting container 1 is transported, for example, to a semiconductor fabricating
25 factory~~or the like~~. The lid unit 4 is detached from the thin plate supporting container 1 ~~carried in the semiconductor fabricating factory or the like~~, a special lid unit for the semiconductor fabricating ~~factory or the like~~ is attached

to the thin plate supporting container 1 and the closed
container~~resultant~~ is carried to~~into~~ a fabricating process.

The upper portion of the slotted plate 3 is
supported~~attached~~ in the container body 2 ~~is supported by~~
5 the upper fitting means~~portion~~ 55 with the. The upper fitting
lug~~piece~~ 57 mated~~fits~~ with the upper bracket~~receiving piece~~
58 of the slotted plate 3. Accordingly, ~~when the contact face~~
~~57A comes into contact with the face 58A to be contacted in~~
~~a state where the supporting face 57B of the upper fitting~~
10 ~~piece 57 is in contact with the face 58B to be supported of~~
~~the upper receiving piece 58,~~ the upper portion of the slotted
plate 3 is securely supported on the container body 2 ~~side~~.
Consequently, the slotted plate 3 does not swing and is securely
supported ~~in the supporting portion,~~ and positioning in the
15 front/rear direction of the slotted plate 3 is
provided~~performed~~. In this~~such a~~ manner, ~~deformation such~~
as deflection of the slotted plate 3 is reduced~~repressed~~ and
the slotted plate 3 accurately positioned~~is supported in an~~
~~accurate position~~.

20 The lower portion of the slotted plate 3 is supported
by the lower fitting means~~portion~~ 56.

First, the slotted plate 3 is vertically positioned
~~in the vertical direction~~ by the vertical ~~direction~~
positioning means 65. The lower end face of the lower plate
25 69 of the vertical ~~direction~~ positioning means 65 fits in
the fitting notch 68A of the ~~vertical direction~~ supporting
piece~~bracket~~ 68, thereby accurately vertically positioning
of the slotted plate 3 ~~in the vertical direction is performed~~.

In this case, the notch 71 on the slotted plate 3 ~~side~~ of the horizontal-~~direction~~ positioning means 66 seats on fits with the horizontal-~~direction~~ supporting piece positioning projection 72 on the container body 2 ~~side~~, thereby positioning
5 the slotted plate 3 in the horizontal direction.

Referring to Fig. 17 Further, ~~at the~~ front/rear-~~direction~~ supporting piece positioning plate 73 of the front/rear-~~direction~~ positioning means 67 comes into contact with the lower portion of each of the side walls 2C and 2D
10 of the container body 2 to ~~perform positioning of~~ the slotted plate 3 in the front/rear direction.

At this time, the locking ~~piece~~ member 76 of the stopper 75 mates fits with the locking projection 77 to prevent support the slotted plate 3 from dislodging upward ~~so as not to come~~
15 ~~off to the above.~~

The slotted plate 3 can be thereby accurately positioned with the upper fitting ~~means~~ portion 55 and the lower fitting ~~means~~ portion 56 and easily fixed. ~~In the case of~~ For detaching the slotted plate 3, the locking ~~piece~~ member 76 is pulled
20 away from the container body to the front side to move the slotted plate 3 upward thus enabling. ~~It enables~~ the slotted plate 3 to be easily detached.

Due to the shape of the ~~The~~ plate ~~element~~ piece 50 of the slotted plate 3, ~~is formed so that a portion from the~~
25 ~~inner side to an intermediate position is curved along the periphery of the semiconductor wafer S and a portion from the intermediate position to the outlet/inlet port is formed along the container body 2 side.~~ Thus, the semiconductor

wafers S can be smoothly inserted/taken in/out of the container body 2 and can be prevented from coming into contact with the plate elements piece 50.

~~—— The thin plate supporting projection 52 for supporting~~
5 ~~the semiconductor wafer S is provided on each of the inner~~
~~side and outlet/inlet side of the plate piece 50, and the~~
~~thin plate supporting projection 52 on the outlet/inlet port~~
~~side is provided around the intersection between the inner~~
~~periphery of the plate piece 50 and the periphery of the~~
10 ~~semiconductor wafer S, so that the semiconductor wafer S~~
~~inserted in the container body 2 can be stably supported.~~

~~—— The upward swollen portion 82A of the contact portion~~
~~82 is pressed with the lid unit 4 in a state where the lid~~
~~unit 4 is attached to the container body 2 so that the periphery~~
15 ~~of the gasket 80 of the lid unit 4 is closely attached to~~
~~the container body 2 side. Consequently, even when the gasket~~
~~80 is deflected and a gap occurs between the gasket 80 and~~
~~the container body 2, the peripheral portion can be closely~~
~~attached to the container body 2 side with reliability. In~~
20 ~~such a manner, the container body 2 is sealed with the gasket~~
~~80.~~

~~—— In the base end supporting portion 81, the seal piece~~
~~83 comes into contact with the lid unit 4 side and elastic~~
~~deformation caused by the contact of the seal piece 83 is~~
25 ~~absorbed by the annular groove 84 to keep air tightness between~~
~~the gasket 80 and the lid unit 4. Further, the upward swollen~~
~~portion 82A of the contact portion 82 is also closely attached~~
~~to the lid unit 4 to keep air tightness between the gasket~~

~~80 and the lid unit 4.~~

~~Since the gap between the cover plate 45 for the container body 2 and the lower end of the semiconductor wafer 5 housed in the container body 2 is set minimum so as to fully absorb the shock, the size of the container body 2 is reduced. When the size of the container body 2 is reduced, the size of the thin plate supporting container 1 itself is accordingly reduced. Consequently, when packed, the gap between the bottom of the thin plate supporting container 1 and a packing carton increases. The cushioning material in the larger gap can be also increased, and the shock absorbing capability in case of a shock of a fall or the like can be largely improved.~~

~~In the attaching/detaching mechanism 12 for supporting the top flange 5 and the handle 6 for carry, at the time of attaching the top flange 5 or the like, the receiving rail 29B engages with the fitting rail 29A, the sliding portion 31 is fit in the supporting portion 30, and the top flange 5 or the like is slid to the inner side. Thereby the contact portion 36 of the inner side locking pawl 34A is locked by the locking projection 33 and the contact portion 38 of the front side locking pawl 34B is locked by the locking projection 33. In such a manner, the top flange 5 or the like can be easily attached.~~

~~For~~At the time of detachment of the top flange 5, the supporting bar ~~portion~~ 39 of the front-side locking pawl 34B is lifted with the user's finger to disengage to come off the contact portion 38 from the locking projection 33, and the top flange 5 ~~or the like is~~ slid shifted to the front side

~~and. In such a manner, the top flange 5 or the like can be easily detached.~~

Since the supporting portion 30 and the sliding portion 31 ~~widen from~~
~~are set in such a manner that the interval is~~
5 ~~narrow on the front side to and is wide on the inner side,~~
~~so that the sliding portion 31 can be easily mated~~fit with
the supporting portion 30.

Further, since~~Since~~ the top flange 5 ~~or the like is~~
supported by the fitting rails 29A and the receiving rails
10 29B, the top flange 5 can be smoothly moved and easily
attached/detached.

In the event of~~case where~~ a strong force ~~is applied~~
in the direction tending to dislodge~~of making~~ the top flange
5, i.e. ~~or the like come off by an abnormal shock due to~~
15 ~~a fall or the like, of the thin plate supporting container~~
~~1 in a state where the top flange 5 or the like is attached,~~
~~by the support of the supporting bar portion 39 prevents~~on
~~the front side locking pawl 34B side, the top flange 5 or~~
~~the like is prevented from coming off. Since the contact~~
20 ~~portion 38 of the front-side locking pawl 34B is provided~~
~~to the container body 2 side as the other member side than~~
~~the base end portion of the supporting bar portion 39, the~~
~~contact portion 38 is pressed in the direction of strongly~~
~~pressed against the locking projection 33 and does not come~~
25 ~~off. Thus, even when a strong force is applied to the flange~~
~~5 or the like due to a shock or the like, the contact portion~~
38 does not release~~come off~~ from the locking projection 33,
and the supporting bar portion 39 ~~supports the top flange~~

~~5 or the like with reliability to prevents~~ the top flange
5 ~~or the like~~ from coming off.

To attach~~In the latch mechanism 86, at the time of~~
attaching the lid unit 4 to the container body 2, the user
5 grips the grip 91 of the first arm 87 to lift the lid unit
4 ~~up and place it on~~covers the container body 2 ~~with the lid~~
~~unit 4 from above~~. At ~~this~~the time, since the first arm 87
is set at 90° with respect to the second arm 88 and the second
arm 88 is set at 35° with respect to the container body 2,
10 the grip 91 is positioned on a side of the lid unit 4 ~~in a~~
~~state where the first and second arms 87 and 88 are pivoted~~
~~to their swing to each limits~~, and the grip 91 is ~~in a~~the position
at which the user can easily lift the lid unit 4. ~~in an optimum~~
~~state. By gripping the grip 91, the user covers the container~~
15 ~~body 2 with the lid unit 4. By~~Then, still gripping the grip
91, the grip 91 is pushed downward, whereby the. ~~The locking~~
~~pawl 90 in the base end portion of the first arm 87 comes is~~
brought into contact with the container body 2 ~~side~~ and the
lid unit 4 is fixed to the container body 2.

20 To detach~~In the case of detaching~~ the lid unit from
the container body, a user grips the grips 91 of the first
arms 87 and pulls the grips 91 away from the container body
2 to the opposite sides. The locking pawl 90 in the base end
portion of the first arm 87 is thereby released~~detached~~ from
25 engagement with the container body 2 ~~side~~ and the lid unit
4 is disengaged. ~~The user still grips the grips 91 to lift~~
~~the lid unit 4. At this time, Because~~ the locking pawl 90 is
pivoted as ~~in the base end portion swings to a position in~~

which it does not come into contact with the container body
2 in a state where the second arm 88 swings makes the first
arm 87 swing to its the limit position. Consequently, even
when the user lifts the lid unit 4 up, the locking pawl 90
5 does not come into contact with the container body 2, and
the lid unit 4 can be easily detached.

~~As described above, the grip 91 is supported in a position
in which it is easily gripped on a side of the lid unit 4,
and the locking pawl 90 is open to the position where it does
10 not come into contact with the container body 2. Thus, the
lid unit 4 can be easily attached/detached.~~

Because eachThe semiconductor wafer S is fit in athe
fitting groove 97 ~~of the thin plate pressing member 94 is~~
~~supported by being fit in the fitting groove 97 formed at~~
15 ~~an acute angle. When the fitting groove 97 is formed at an~~
acute angle, the periphery of the semiconductor wafer S ~~is~~
~~fit in the fitting groove 97 and is securely supported and,~~
Therefore, even when a strong shock is received by applied
to the thin plate supporting container 1, ~~the periphery of~~
20 ~~the semiconductor wafer S is prevented from~~ caught in the
~~fitting groove 97 and is securely supported while preventing~~
rotation and shifting a shift of the semiconductor wafer S.

Since the pressing bands 96 are is formed in a wavy wave
shape along the peripheries of the semiconductor wafers S,
25 ~~even if a~~the semiconductor wafer S comes out off from the fitting
groove 97, it will ~~the semiconductor wafer S does not enter~~
the gap between the pressing bands 96.

Since the V-shaped groove plate piece 15 is detachably

mounted ~~on~~attached to the supporting stand 16 ~~of~~in the body positioning means 11, irrespective of the material of the container body 2, the V-shaped groove plate piece 15 ~~can~~be made of a material only by which the fitting projection, of the mounting stand in the semiconductor fabricating process, easily slides. When the fitting projection of the mounting stand used in the semiconductor fabricating process is inserted~~fit~~ in the fitting groove 13 of the body positioning means 11 guided by the V-shaped groove plate piece 15 made of a material having low surface frictional resistance, smooth sliding is achieved and the thin plate supporting container 1 can be accurately positioned.

Since the V-shaped groove plate piece 15 is detachable ~~from~~can be detachably attached to the supporting stand 16, it can be easily replaced in accordance with the material of the projection which it receives~~on the opposite side~~.

[Modifications]

(1) Although the gasket 80 (Fig. 29) is provided on the lid unit 4 side in the foregoing embodiment, it can be provided on the container body 2 side. ~~In this case as well, functions and effects similar to those of the embodiment can be obtained.~~

(2) Although four upper fitting lugs~~pieces~~ 57 (Fig. 20) ~~of the upper fitting portion 55~~ are provided in the described embodiment, it is sufficient to provide at least two upper fitting lugs~~pieces~~ 57 at opposing~~both~~ ends. The number of the upper fitting lugs~~pieces~~ 57 may be varied~~is properly set~~ according to the size, required~~requested~~ strength, and the

like. ~~In this case as well, functions and effects similar to those of the foregoing embodiment can be obtained.~~

(3) Although two sliding and supporting means 27 (Fig. 12) are provided in the foregoing embodiment, three or more sliding and supporting means may be provided. Although two guide rails 29 are provided, one guide rail 29 or three or more guide rails 29 may be provided. ~~In this case as well, functions and effects similar to those of the foregoing embodiment can be obtained.~~

(4) Although the supporting stand 16 (Fig. 4) of the body positioning means 11 is formed so as to construct a part of the fitting groove 13 in the foregoing embodiment, the supporting stand 16 may be also formed so as to construct the whole fitting groove 13.

~~As described above in detail, the thin plate supporting container of the invention produces the following effects.~~

~~(1) The upper fitting piece has a contact face having a flat plane shape which comes into contact with the slotted plate side to thereby position the slotted plate in the front/rear direction while preventing swing of the slotted plate, and a supporting face for supporting the contact face in a state where the contact face is in contact with the slotted plate side, and the upper receiving piece has a face to be contacted having a flat plane shape which comes into contact with the contact face of the upper fitting piece to thereby position the slotted plate in the front/rear direction while preventing swing of the slotted plate, and a face to be supported which comes into contact with the supporting face~~

~~of the upper fitting piece to thereby support the face to be contacted in a state where the face to be contacted is in contact with the contact face of the opposite side. Accordingly, the slotted plate can be supported with~~

5 ~~reliability without and accurately positioned in the front/rear direction while suppressing swing of the slotted plate. Thus, deformation such as a deflection of the slotted plate is prevented and the slotted plate can be supported in an accurate position.~~

10 ~~(2) The upper fitting portion for supporting an upper portion of the slotted plate to the container body side, and the lower fitting portion for supporting a lower portion of the slotted plate to the container body side are provided. The lower fitting portion has: a vertical direction~~

15 ~~positioning means for positioning the slotted plate in the vertical direction; horizontal direction positioning means for performing positioning in the horizontal direction; and a front/rear direction positioning means for performing positioning in the front/rear direction. Consequently, the~~

20 ~~lower portion of the slotted plate can be accurately positioned and supported.~~

~~(3) The vertical direction positioning means has a vertical direction supporting piece which is provided in a lower portion of each of side walls facing each other in the~~

25 ~~container body and is fit in a lower portion of the slotted plate, and comes into contact with a lower end of the slotted plate, thereby performing positioning in the vertical direction of the slotted plate. Thus, the lower portion of~~

~~the slotted plate can be accurately positioned in the vertical direction and supported.~~

~~(4) — The horizontal direction positioning means has a notch formed in a lower portion of the slotted plate, and a~~
5 ~~horizontal direction supporting piece which is provided in a lower portion of each of side walls facing each other in the container body, fits with the notch in the lower portion of the slotted plate. Thus, the lower portion of the slotted plate can be accurately positioned in the vertical direction~~
10 ~~and supported.~~

~~(5) — The front/rear direction positioning means has a front/rear direction supporting piece which is provided so as to extend from the lower portion of the slotted plate to a back side of the slotted plate, and fits with the lower~~
15 ~~portion of a side wall face of the container body. Consequently, the lower portion of the slotted plate can be accurately positioned in the front/rear direction and supported.~~

~~(6) — A stopper for stopping disengagement to the above of~~
20 ~~the slotted plate by being locked to the container body side is provided in a lower portion of the slotted plate. Thus, the slotted plate can be supported so as not to be disengaged to the above.~~

~~(7) — The slotted plate is constructed by arranging a~~
25 ~~plurality of plate pieces for supporting the plurality of thin plates one by one, the plate piece is extended from an inner side of the container body to an outlet/inlet port of the thin plate and is formed so that a portion from the inner~~

~~side to an intermediate position is curved along the periphery of the thin plate and a portion from the intermediate position to the outlet/inlet port is along the container body side, on the inner side and the outlet/inlet port side in the plate piece, thin plate supporting projections for supporting the thin plates are provided, and the thin plate supporting projection on the outlet/inlet port side is provided around an intersecting point of an inner periphery of the plate piece and the periphery of the thin plate. Consequently, a thin plate can be stably supported by the thin plate supporting projections provided on the inner side and the outlet/inlet port side.~~

~~(8) A gasket is provided between the lid unit and the container body, the gasket has a base end supporting portion for supporting the whole by being fit to the lid unit side or container body side, and a contact portion formed so as to extend from the base end supporting portion, the contact portion is formed by being expanded from the base end supporting portion into a flange shape, making its intermediate portion swollen upward, and making an outer periphery folded downward, and the intermediate portion is pressed against the lid unit side or the body side in a state where the periphery is in contact with the container body side or the lid unit side, thereby making the periphery closely attached to the container body side or the lid unit side by elastic force of the contact portion. Thus, air tightness between the lid unit and the container body can be improved.~~

~~(9) The thin plate supporting container further includes:~~

~~a seal piece which is provided on the inner side of an upper surface of a base end supporting portion of the gasket, is extended upward, and comes into contact with the lid unit side or container body side; and an annular groove provided~~
5 ~~on the outer side of the seal piece and absorbing elastic deformation of the seal piece. Thus, air tightness between the gasket and the lid unit can be improved.~~

~~(10) A bottom plate of the container body is set so that a gap between the bottom plate and the lower end of the thin~~
10 ~~plate housed in the container body is set minimum so as to fully absorb the shock. Therefore, the height of the container body can be reduced.~~

~~(11) Since the height of the container body is reduced only by an amount corresponding to reduction in the gap between~~
15 ~~the bottom plate of the container body and the lower end of the thin plate housed in the container body, the size of the thin plate supporting container can be reduced. Consequently, cushioning used at the time of packing can be increased, and impact absorbing capability in the case of an impact can be~~
20 ~~largely improved.~~

~~(12) A locking means of an attaching/detaching mechanism has a locking projection provided for the one of members or the other member, and a locking pawl provided for the other~~
25 ~~or one of members, the locking pawl is constructed by a contact portion which comes into contact with the locking projection and a supporting bar portion for supporting the contact portion, and the supporting bar portion is formed so as to extend to the other side member and to the front side of the sliding~~

and supporting means. With the structure, the top flange or the like can be prevented from coming off due to an impact.

(13) Since the contact portion of the locking pawl is provided on the side of the other side member than the base end portion of the supporting bar portion, the contact portion does not come off from the locking projection and the top flange or the like can be prevented from coming off due to an impact.

(14) Two supporting portions and two sliding portions of the sliding and supporting means are provided in parallel, and each of the interval between the supporting portions and the interval between the sliding portions is set to be small on the front side and to be large on the inner side. Thus, the sliding portion can be easily fit in the supporting portion.

(15) Since guide rails for guiding two members supported by the sliding and supporting means so as to slide and performing positioning in a direction orthogonal to the sliding direction are provided, by being guided by the guide rails, the top flange or the like can be easily attached/detached.

(16) A latch mechanism is constructed by a first arm locked to the container body side to fix the lid unit to the container body, and a second arm swingably supported by the lid unit and swingably supporting the first arm, the first arm is constructed by a locking pawl which is provided in a base end portion of the first arm and comes into contact with the container body side, and a grip which is provided at a tip portion and is positioned in a side of the lid unit in a state where the first and second arms swing to the limit, and the

~~second arm swings to a position where the locking pawl of the base end portion of the first arm does not come into contact with the container body in a state where the first arm swings to the limit. With the structure, the lid unit can be easily~~
5 ~~attached/detached to/from the container body.~~

~~(17) The first arm is open up to 90° with respect to the second arm and the second arm is open up to 35° with respect to the container body. Therefore, the first arm can be prevented from coming into contact with the container body and the grip~~
10 ~~can be supported in a side of the lid unit and is in a position at which the grip is easily gripped.~~

~~(18) A thin plate pressing member is provided on the back face of the lid unit, the thin plate pressing member for supporting thin plates by pressing an upper portion of a thin~~
15 ~~plate housed in the container body when the lid unit is attached to the container body, fitting grooves in each of which the thin plate is fit and supported are provided for the thin plate pressing member, and the fitting groove is formed at an acute angle so as to catch the periphery of the thin plate.~~
20 ~~Therefore, a thin plate can be supported with reliability.~~

~~(19) A thin plate pressing member is provided on the back face of the lid unit, the thin plate pressing member for supporting thin plates by pressing an upper portion of a thin~~
25 ~~plate housed in the container body when the lid unit is attached to the container body, the thin plate pressing member has a number of pressing bands which are arranged in parallel, comes into contact with the periphery of the thin plate, and supports the thin plates at predetermined intervals one by~~

one, and the pressing bands are formed in a wave shape along the peripheries of the thin plates. Thus, a thin plate can be prevented from entering the gap between the pressing bands.

(20) Body positioning means for positioning the whole container body is provided on the bottom of the container body disposed transversely, and the body positioning means includes V-shaped groove plate pieces constructing V-shaped grooves provided in three positions in three directions on the bottom of the container body, and supporting stands for supporting the V-shaped groove plate pieces. Therefore, a V-shaped groove plate piece made of a material different from that of the container body can be attached.

(21) Since the V-shaped groove plate piece is made of a material having low surface friction resistance, the projection on the mounting stand smoothly slides on the V-shaped groove plate piece and the thin plate supporting container can be accurately positioned.

(22) Since the V-shaped groove plate piece is detachably attached to the supporting stand, the V-shaped groove plate piece can be easily replaced with a V-shaped groove plate made of a different material in accordance with the material of the projection on the other side.

ABSTRACT OF THE DISCLOSURE

~~The present invention is directed to realize accurate positioning of a slotted plate. Disclosed is a~~ thin plate supporting container includes~~having~~ a container body for housing therein semiconductor wafers, a lid unit for closing the container body, and slotted plates for supporting the semiconductor wafers from opposing~~both~~ sides. There are provided an upper fitting portion for supporting an upper portion of the slotted plate, and a lower fitting portion for supporting a lower portion of the slotted plate. An upper fitting piece of the upper fitting portion has a planar contact face ~~having a flat plane shape~~ which comes into contact with the slotted plate ~~side~~ to thereby position the slotted plate in the front/rear direction while suppressing swing of the slotted plate, ~~and a supporting face~~. The upper receiving element on the slotted plate ~~piece~~ has a planar contact face ~~to be contacted having a flat plane shape, and a face to be supported~~. The lower fitting portion provides~~has~~ vertical ~~direction positioning means for positioning the~~ semiconductor wafer in the vertical direction, horizontal ~~direction positioning means for performing~~ positioning in the horizontal direction, and a front/rear ~~direction positioning means for performing~~ positioning in the front/rear direction.